Sidebands

W2EGB

The Newsletter of the EAST GREENBUSH AMATEUR RADIO ASSOCIATION

www.egara.org

June 2024

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Great Weather and Turnout for Hamfest 2024!

The EGARA's 20th annual Hamfest was another success as perfect weather helped to draw hams from all over the Greater Capital District and beyond. The event also helped boost the club's financial position, providing operating revenue for the year ahead.

The day also saw a variety of great raffle and door prizes handed out, as well as three cash Grand Prizes. Club member Don Mayotte, KB2CDX, won the $50 and was kind enough to donate it back to the club treasury. A photo scrapbook of the day is on page two.

Hamfest 2024 also went smoothly thanks to the many club members who helped set up Friday evening and early Saturday morning. They then pitched in to make sure the event itself went exactly as planned. The kitchen and grill crew also stayed on top of the food orders, making sure breakfast sandwiches, burgers and hot dogs were served up fresh and hot.

This year's Hamfest marked a return to the East Greenbush Fire Department pavilion, after holding the event at the town park for the past couple of years. Tailgaters enjoyed the additional space provided by the fire department's large parking lot, and vendors enjoyed the spacious space and cover offered by the pavilion.

Club members were also easily identified thanks to the custom designed Hamfest staff shirts donated by club member Joe Ostering, N2CJF, who owns Riverside Stitch and Print in Deep River, Connecticut.

With the 2024 Hamfest now complete, plans are already underway for next year -- with the East Greenbush Fire Department pavilion already reserved for Saturday, June 7, 2025. So, save the date!

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ARRL Hacked in Cyber Attack

The American Radio Relay League was hit by a sophisticated cyber attack on May 12th, compromising its network devices, servers, cloud-based systems, and PCs. Its telephone system, and the ability to process license tests were also involved.

ARRL management quickly established an incident response team, leading to an extensive effort to contain the damage and restore the affected systems, including testing of applications and interfaces to ensure proper operation. It said most services and systems are back up and running, although some issues linger.

ARRL stressed that it does not store credit card information anywhere on its systems, and does not collect social security numbers. The member database only contains publicly available information like name, address, and call sign along with ARRL specific data like email preferences and membership dates.

Next Membership Meeting - June 12, 2024 - Field Day Planning

Hamfest 2024 in Pictures

Melva Olson, KE2BJU, won RT System program software

Hams line up to buy raffle tickets

Norbert Van Buren, N3RBY. won the $250 Grand Prize

Tailgaters filled the parking lot with a variety of gear for sale

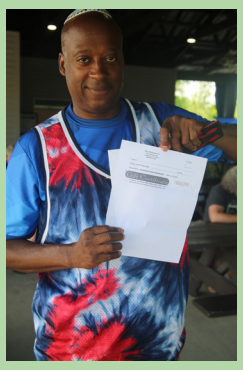
Food was fresh and hot thanks to the EGARA kitchen crew!

Luck came twice for Frank Gitto, KAVVI, who won two prizes

Great food and good friends made for a perfect day!

Laken Huba became EGARA's version of Vanna White, pulling the winning door prize and raffle tickets

Dave Schneider had connectors galore for sale



Brian Tuitt, N2FNP, won the $50 gift certificate from The Wireman

Glenn Cooper, W2BK, scored a $50 Gift Certifcate from DX Engineering

Avery Sudol, K2AVY (above) won a nice portable multi-band receiver, and Lauren Nodonly, W2NYX (right) won a B-TECH tri-band HT. Both also joined EGARA as new members!

Robert Bloom, WA2ZNU, won a $50 ARRL Gift Certificate

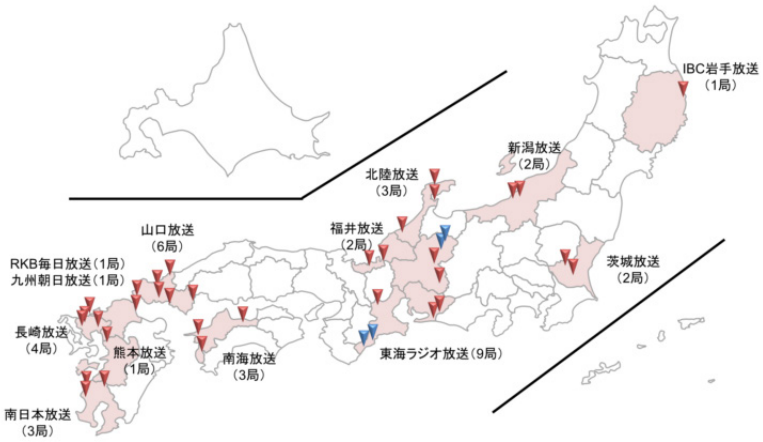
On the Beam
News & Notes

Japanese AM Stations Begin Suspensions
Regulators allow a year-long trial of suspended AM services to gauge the impact

Thirteen private radio companies in Japan are looking at what a full transition to FM — or AM shut down — would mean for their AM services. The broadcasters are taking advantage of a policy announced last year by the Japanese Ministry of Internal Affairs and Communications that allows them to suspend operations for as long as one year.

The first wave of stations began going dark on AM on Feb. 1, 2024, and most plan to be off air until Jan. 31, 2025. In total, 34 AM stations operated by the 13 companies will shut down for at least a portion of the year. Japanese public broadcaster NHK is not participating in the AM suspension.

During the suspension period, broadcasters are expected to make their programming available via FM, cable television, Internet distribution, or other methods. Four AM stations in areas that could not be adequately served via an alternative means were not allowed to suspend operations.



The Ministry of Internal Affairs and Communications establish the AM suspension measure in order to verify the impact AM shutoff on broadcasters and listeners. The ministry noted that the costs of maintaining AM services are increasingly difficult for private broadcasters, leading them to consider converting their operations to FM or simply shutting down.

The end of the suspension measure coincides with the license renewal cycle for AM broadcasters and, according to a report in Japan Today, "it will be up to each company to decide what to do."

Red markers indicate stations allowed to suspend their AM operations, blue markers stations that were not allowed.

Since 2014, Japan has been licensing new FM stations in the 90.0 to 94.9 MHz portion of VHF band II vacated after the digital television transition. (Traditionally, FM radio in Japan operates on 76.1 to 89.9 MHz.) Referred to as "Wide FM," the expanded band channels have been used for "FM complimentary relay stations" that act as repeaters for AM stations to help counter coverage issues in urban areas, mountainous regions, disaster resiliency, and areas subject to interference from foreign transmissions.

In considering what impact the loss of AM could have during an emergency, the ministry looked at the Jan. 1, 2024, Noto Peninsula earthquake. The 7.5 Mw event took three FM and one AM station off the air temporarily. Hokuriku Broadcasting's Waijima AM station was off air for three days, compared to FM stations going dark for one to 22 days.

During the suspension period, the ministry is operating a help desk to take comments from the public and other interested parties about the AM suspension.

Next Stop: Field Day!

Every June, more than 40,000 hams throughout North America set up temporary transmitting stations in public places to demonstrate ham radio's science, skill and service to our communities and our nation. It combines public service, emergency preparedness, community outreach, and technical skills all in a single event. Field Day has been an annual event since 1933, and remains the most popular event in ham radio.

This year, EGARA will again participate in Field Day weekend -- June 22-23 -- at the Rensselaer County Search and Rescue Building. As in the past, set up will take place Friday afternoon and Saturday morning, with on-air operations beginning Saturday at 2 pm and breakdown starting around noon on Sunday. The plan is to return to full Field Day operations after last year's limited participation due to concerns over severe weather forecasts.

Planning for Field Day will be the main topic of discussion at the club's regular June 12th membership meeting.

This year, those members who plan to operate will receive an on-line sign up sheet sent to their email address. In addition to basic information such as name and call sign, it will include a list of activities and operating shifts that can be checked off. Once completed, the sign up sheet is submitted to the club so it can build the operating schedule for Field Day operations. A copy will also be sent to the member's email account.

EGARA is hoping to operate "off grid" using solar and battery power, which will gain the club extra Field Day points. News releases and social media posts are also planned, which also earn points toward the club's total. Local public officials will be invited to visit the club's Field Day operations, as will members of the public and the media -- all of which can also earn additional points.

EGARA plans to operate two HF stations using both voice and Morse Code. Dave Smith, WA2WAP, is also planning to run a digital station. Hopefull the bands will cooperate as the club works to contact as many stations as possible on the 160-, 80-, 40-, 20-,15- and 10-Meter HF bands, as well as all bands 50 MHz and above.

Field Day is open to all amateurs in the areas covered by the ARRL/RAC Field Organizations and countries within IARU Region 2. EGARA members who hold a Technician license will also have the opportunity to work all HF bands when they are paired with a member who hold an appropriate higher class license.

DX stations residing in other regions may be contacted for credit, but are not eligible to submit entries.

Of course, the underlying purpose of Field Day is to learn to operate in less than optimal conditions, simulating those that might be found during emergencies triggered by severe weather, natural disaster or widespread loss of utility services.

As always, EGARA will be providing food, beverages and snacks for members who operate during Field Day.

EGARA May Meeting Minutes

- **The The meeting was called to order at 7:00 PM.**
- **Introductions were made by all members (17) present.**
- **President Jackson was able to obtain Internet for the RCSAR building from T-Mobile. A date for when the Internet would be installed had yet to be determined. (Note: it is now operational)**
- **Jackson reached out to Channel 10's Chief Engineer to find out if we could use their tower site. A potential site visit for Friday the 10th was scheduled for Jackson. On-site is a remaining tower and building with power but no backup generator. Jackson noted that the Chief Engineer was going to get back to him about if the club could use the location.**
- **The club made several investments to the RCSAR building including a new fridge provided by Feiden Appliances, as well as a working microwave was provided by member Walt Snyder, N2WJR, for EGARA and RCSAR to use. Two new sink faucets were also purchased and installed at the SAR kitchen and both sinks work again. Jackson is waiting on an oven from Feiden Appliances and a shop-vac was purchased for use at the RCSAR building.**
- **A discussion about Field Day 2024 concluded with Dave Smith, WA2WAP agreeing to bring a battery powered digital station for Field Day bringing the number of stations EGARA would have on the air to three. Don Mayotte, KB2CDX suggested bringing a solar powered generator for backup power. Mayotte said he would bring his generator in case it was needed.**
- **A discussion about the Hamfest concluded with noting that setup would need to happen early on Sunday instead of Saturday since the pavilion at the Phillips Road Firehouse was double booked on Saturday. Admission for the Hamfest would be $8. Some of the prizes from MFJ, RT Systems, and Radioddity included a portable SWR Meter, Programming Software, and a Dual band Narrow banded HT among others. Jackson also suggested having three cash prize drawings instead of one $500 drawing, the three drawings would be for $250, $100, and $50. Jackson noted that entry tickets would need to be purchased from Vista Print. Pete Sochocki, NY2V suggested having someone staff a table for the club at the Hamfest. Chris Linck said he'd do the talk in for the Hamfest.**
- **The meeting ended at 7:40 PM with no objections. Several members stayed after to go through supplies to see what else would need to be purchased for the Hamfest.**
- **Minutes recorded by Secretary David Jaeger, K2DEJ.**

Aurora Propagation, Northern Lights

The sun has been busy, and it's been a mixed bag for radio amateurs. Recently, millions of people got a chance to see the Aurora Borealis for the first time, as the northern lights were active farther south than they had been in decades. The brilliant displays, visible as far south as Mexico, were a result of a series of coronal mass ejections. The energy from our star interacted with particles in the upper atmosphere, causing them to glow in dancing curtains of multicolored light.

VHF aurora activity was up significantly, according to DX spotting clusters and activity heard on the air. The 2- and 6-meter bands were especially active, as the aurora acted like a reflector in the sky to enable signals to propagate much farther than they normally can on those bands.

ARRL Central Division Director Carl Luetzelschwab, K9LA, is a leading expert on propagation. He provided the following analysis of the situation:

"May 10, 11, and 12 of 2024 may go down as one of the greatest space weather storm periods of our lifetimes. It all started with two big sunspots in early May. These two big sunspots were identified as AR3663 (in the northern solar hemisphere) and AR3664 (in the southern solar hemisphere). AR stands for Active Region.

Both of these sunspot regions produced multiple M-class and X-class solar flares, which caused radio blackouts or signals being significantly attenuated on the sunlit side of Earth. Typically, a radio blackout lasts for an hour or so, is most severe on the lower frequencies, and is due to the x-ray radiation from the solar flare increasing D-region absorption.

Northern Lights as seen from the Berkshires on May 11th. Photo by Sierra Harrop, W5DX

Not only did the big solar flares cause radio blackouts, they also caused solar radiation storms due to energetic protons that increased ionospheric absorption in the D region in the polar caps (the area inside the auroral ovals). Solar radiation storms can last for a couple of days and can result in degraded propagation on over-the-pole paths.

But the biggest impact to propagation started on May 8, when AR3664 released multiple Earth-directed CMEs (coronal mass ejections). CMEs manifest themselves as geomagnetic storms by significantly increasing the 3-hour K index. The K index indicates the activity of the Earth's magnetic field and ranges from 0 (quiet) to 9 (extremely disturbed). The image (from https://www.swpc.noaa.gov/) shows the [data from May 10 - 12]. When the K index is this high for such a long time, the electron density in the F2 region of the ionosphere can be significantly depleted for days, not allowing higher frequencies to be propagated. On-the-air activity confirmed this.

In summary, early May was a very interesting period. We saw all three categories of disturbances to propagation — radio blackouts (x-ray radiation from solar flares), solar radiation storms (energetic protons from solar flares), and geomagnetic storms (elevated K indices)."

Meanwhile, the Federal Communications Commission wants to know if Amateur operators noticed any impacts to radio communications during the storm. In a public notice, the FCC wrote:

To better understand the impacts of the geomagnetic storm on the U.S. communications sector, the Bureau is requesting information from communications service providers and the public regarding disruptions in communications between May 7 and 11, 2024, that it believes to be a result of the storm. The Bureau is asking for any available evidence, particularly electromagnetic spectrum analyses, imagery, or chronological logs relating the storm's impacts. Where possible, the Bureau is asking for description of the impacts; make and model of affected communications equipment, which could include transmitters, receivers, transceivers, switches, routers, amplifiers etc.; make, model, and type of affected antennae and their composition; frequencies affected; type and composition of cable adjoining communications equipment and the antennae, if applicable; duration of the impact; and any residual effects observed in the hours following restoration.

Comments may be submitted using the FCC's Electronic Comment Filing System (ECFS) at https://www.fcc.gov/ecfs and referring to PS Docket No. 24-161.

How the Army Handled D-Day Communications

June Marks 80 Years Since the Historic Invasion of Europe

By Mark Durenberger, Radio World

The Allied invasion of continental Europe 80 years ago was a logistical tour de force. Its success hinged on an operative communications network unifying the invading armies and their support systems.

The U.S. Army Signal Corps, or "SigC," was tasked with establishing massive, reliable, multi-channel high-speed voice and "data" networks. These networks would support a mission buildup of more than a million troops in a hostile environment.

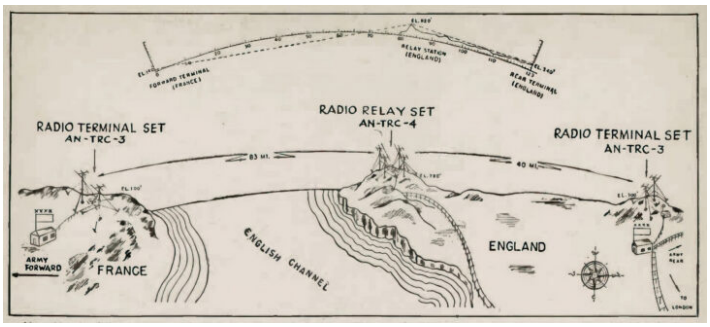
That meant two-way voice circuits to keep decision-makers in touch and high-speed channels to exchange reconnaissance photos and situation maps evaluating the impact of aerial and ship-launched ordnance.

SigC's design baselines were high capacity and agility, with low latency. Communications with the beach had to be established speedily using whatever gear made it to shore in the contested landings. The system had to be mobile: radio supplemented by ad-hoc wire telephony. Contact within operating units had to survive when troops mistakenly landed in one another's sectors.

American troops splash ashore to the Normandy coast of France in June 1944 in a U.S. Army Signal Corps photo.

SigC had estimated it would need some 90,000 transmitters for the job. This mandated frequency coordination. The radios were largely short-range "hand-helds" but also included short- and medium-distance radio links to naval and air elements and Allied headquarters.

Signal-gear manufacturers were asked to provide roll-out proposals for the project and it quickly became apparent that the total number of required radio channels was far larger than the spectrum available (2.5 to 8 mHz). SigC's last-minute solution was to narrow the guard bands between channels to as little as 4 kHz. Fortunately, tactical radios had been designed for crystal-controlled FM operation so this predicted project snafu was resolved by last-minute crystal-regrinding on a vast and massive scale.



A diagram shows the military's communications channels as established shortly after the beach invasion. This image appeared in Radio-Craft magazine in 1945.

In the end, it all worked. In the first three weeks of the invasion, among all those transmitters, only about 80 interference complaints were registered.

A significant amount of radio gear was lost in the initial landings, but SigC's planning had suitably provided for battle attrition. Contact with the beach was generally successful, with the exception of some high-power voice-channel transmitters delayed through circumstance.

Less susceptible to battle damage were some 500 pigeons, landed for the purpose of carrying ammunition-status reports, undeveloped film and emergency messages. At the end of the day, electronic communications were so effective the pigeons could go home to roost.

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How the Army Handled D-Day Communications...

The "backhaul"

No less important than unit tactical communications was the need for reliable high-capacity communications with headquarters in Britain.

Initial contact relied on shore-based transmitters reaching off-shore relay ships for retransmission to England. Shortly after operations began, a SigC team successfully established multi-channel "carrier" systems (Army/Navy Transportable Communications, or ANTRAC) directly from France to England. And by the end of June, surviving an initial series of setbacks, cable ships were able to lay wire communications across the channel.

A wireless relay ship shown in a U.S. Navy archival photo. On board, signals from short-range beach transmitters were patched to long-range transmitters to reach Britain.

Media matters

The relatively "thin-route" requirements for the media were not lost in the planning. Fortunately, key military leaders remained aware of the need to keep the world informed. Media support had failed somewhat sadly in the North African Invasion of 1942 and it was clear that SigC had to do a better job.

America waits for the news. Network reporters are shown feeding news of the invasion back to local stations in the U.S.

David Sarnoff of RCA was appointed by General Dwight Eisenhower to coordinate media communications planning. Sarnoff's efforts resulted in the establishment of a media route through the "London Signal Center," itself the hub of SigC communications. And Sarnoff was able to leverage his high-level relationships to induce the British to establish additional shortwave paths to America.

In the months preceding the invasion, American journalists had been facing implied and actual opposition from the British, who didn't understand Americans' incessant demands for information. As an early demonstration of how the show would be run, SigC established "FAX," its own full-duplex shortwave channel direct to the United States. FAX would become the official channel for communiques from SHAEF, the Supreme Headquarters, Allied Expeditionary Force. FAX would also cue the radio networks tied to it in a "party-line" arrangement.

In turn, the media had to accept certain ground rules. Given that very few journalists were authorized a seat in the initial show, radio reporting would be pooled, coordinated by Edward R. Murrow. Print copy had to be shared among all competitors and recording of radio news reporting was for the first time allowed by the American networks.

In anticipation of the invasion and in the spirit of pool coverage, the radio networks came together in temporary harmony to prepare for "the biggest news story of the decade." Rival news directors met to coordinate coverage and to help one another with planning difficulties.

The ultimate vigil began early on the morning of June 6 when German Radio announced "an invasion of France." The network newsrooms turned up the volume on the FAX circuit and waited for confirmation. The first official communique came through about 2:30 a.m. From then on, it was a matter of watching the teletype and waiting for pool reports.

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How the Army Handled D-Day Communications...

Observing the invasion, some journalists aboard ships or aircraft would make their recordings or write their copy en route; they'd disembark back in England and make a beeline for Britain's Ministry of Information for review and censorship clearance. Recordings were made on a form of "sound film," since ship and aircraft motion made the more traditional system of disc-recording impossible.

From the battleground itself, radio reporters spoke into "transcription machines" of varying complexity. These recordings were then shipped to London on naval transport (and often subjected to unforeseen delay). Some reports made it to London via air on the "SHAEF Shuttle." Once cleared by the censors, the recordings and any live reporting from studios in England were forwarded to shortwave transmitters.

The written media would soon find a pipeline to America direct from the beaches. Two selected commercial companies, Press Wireless and Mackay Radio, were to establish circuits from the continent to the United States. Press Wireless was to become operational on D+60 and Mackay Radio on D+90, but under serious pressure from the press and through a "test arrangement" with SigC, the Press Wireless transmitter system came up early.

All reporters' copy had to be screened by sensors before it could be forwarded to their radio stations and newspapers.
Credit: U.S. Army Center of Military History

Its "direct-to-America" capability at first created a censorship ruckus, but eventually, under press pressure, the military cleared the way for the hundreds of thousands of words destined for American newspapers. The radio recordings contributed to the legacy of wartime journalism.

D-Day coverage was known by journalists as "The Biggest Beat," and history records its success. And the valor and sacrifice of the soldiers landing on those beaches would be the biggest story.

War news from the front finally reaches its ultimate destination... millions of American homes

EGARA Adds Internet to RCSAR Building

The Hotspot donated to EGARA by TechSoup allows access to 5G Internet service provided by the T-Mobile Network.

EGARA has partnered with TechSoup and T-Mobile to bring Internet access to the Rensselaer County Search and Rescue Building (RCSAR). The system uses what's known as a "Hotspot" and allows up to a dozen devices to connect to it simultaneously. It offers both 2.4 gHz and 5 gHz service to wifi devices.

TechSoup helps 501c3 non-profit organizations such as EGARA to acquire computer technology such as hardware, software and related services for free or at reduced costs. EGARA was able to have the hotspot device donated at no charge and was able to secure unlimited high-speed Internet service through T-Mobile for just $10 a month.

"We are very fortunate and grateful to have partnered with both TechSoup and T-Mobile, allowing us to access the Internet for things such as Zoom meetings, web searches and video presentations,' said EGARA President Bryan Jackson, W2RBJ. "We will continue to explore other offerings made by TechSoup that can help the club meet its mission."

EGARA Gets a Thank You

Rensselaer County Search and Rescue, Inc.
PO Box 149, East Greenbush, NY 12061-0149
www.rcsar.com
Follow us on Facebook

May 5, 2024

Dear Members of the East Greenbush Amateur Radio Association,

The members of Rensselaer County Search and Rescue would like to thank the East Greenbush Amateur Radio Association for all the work you have done so far at our building including cleaning the kitchen, donating a new fridge, fixing our counter top, and installing new faucets. The building looks and smells so much better already. Our members greatly appreciate all the work your organization has done and will do in the future. We feel this is already a successful partnership and look forward to many years of partnership with the East Greenbush Amateur Radio Association.

Thank you again,

Gina Pendolino
Secretary

Build a 1920s Amateur Transmitter

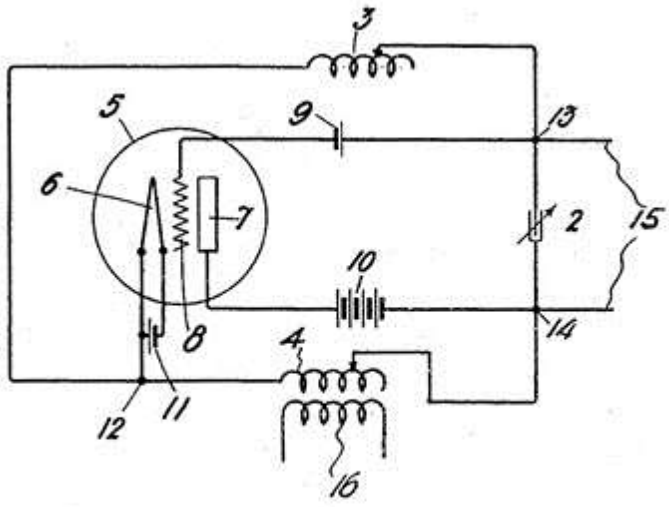
By Scott M. Freeberg, WA9WFA

In the 1920s hams were embracing the latest technologies as they migrated from rotary and mechanical spark transmitters to the new electron tube based oscillators and transmitters. To the modern eye, that '20s technology may seem crude and unusable but there are a group of Antique Wireless Association (AWA) hams today that are still building those transmitters and using them on the air to contact other hams around the country.

In the December 2008 AWA Bruce Kelley Memorial 1929 QSO Party, there were approximately 58 stations on the air using 1929 style transmitters on 3.5 MHz and 7.0 MHz. If you've thought about building and operating your own 1929 transmitter, here is your chance. This article will discuss how to build an 80 meter 1929 style transmitter that can be used in the 1929 QSO Party or any other time for that matter.

This oscillator configuration was invented by Ralph Hartley, an engineer from AT&T, in 1915. The "Hartley Oscillator," as it was usually called, was a popular transmitter during the 1920s. It is a simple circuit consisting of two coils, a variable capacitor, the tube, and a handful of small parts. Don't be fooled though. This simple circuit is easily capable of working coast to coast and around the world.

The circuit that I used was published in QST August, 1928 and is typical of the configuration used in the 20s and 30s. I've taken some liberty with the component values to reflect what I had in my junkbox. The transmitter is capable of producing a pleasant and fairly stable CW tone. While working this year's AWA 1929 QSO Party, I heard several absolutely beautiful Hartley oscillators, so there's no reason for you to have anything less than a gorgeous signal.



The Original Hartley Patent: #1,356,763

I've never built a single-tube Hartley transmitter before so I thought that putting one together while writing this article would be a good experience for both you and me. And it was. I started building it Saturday morning and finished the testing by early Sunday afternoon.

1920s era tubes can range in price from a few dollars to hundreds of dollars. For this project I selected the type 27, which is very inexpensive. The 27 (this type number might be preceded by UX2 or UX3 in older versions) was a very popular audio tube in the 1920s and can be purchased at hamfests in the range of $3-$5. It is a 5-pin glass envelope triode with an indirectly heated cathode. Lighting the heater requires 2.5 volts AC @ 1.75 amperes. The type 27 is capable of generating 2 to 4 watts of output power depending on the plate voltage and plate current.

Construction

I've included the schematic diagram of my transmitter with the actual values of the parts that I used (see page 10). For the PA tuning capacitor, I used a parallel combination of 400 pF fixed and 150 pF variable. The fixed capacitor places the transmitter in the band; the variable capacitor gives us some bandspread tuning around the band. This circuit also has a 600 pF capacitor in series between the high voltage and the PA coil. This keeps the high voltage off of the coil and reduces the risk of shock.

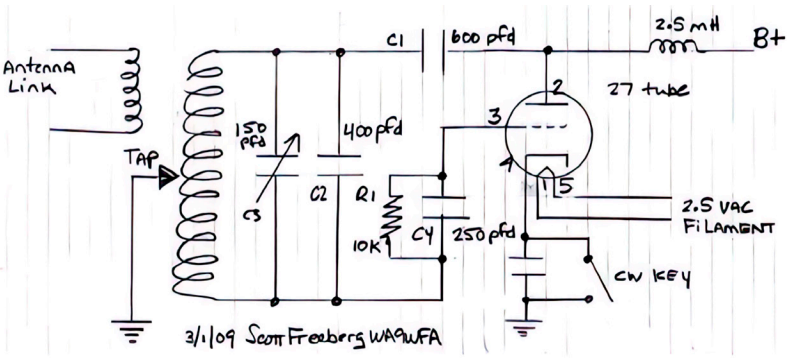
The transmitter was built on a piece of wood and almost all the components were attached with woodscrews. Just two machine screws were used. This genuine 1920's construction technique is a real treat to work with because it's not only easy to place parts, but you can also change your mind and move them in a matter of seconds. With a cordless drill and a box of wood screws, you can complete the job in short order.

-continued on page 12-

Build a 1920s Ham Transmitter...

The parts were assembled on an 8" x 10" piece of 3/4" thick pine board. The dimensions are not critical but if this is your first transmitter project, it might be prudent to leave yourself some extra space to work with.

Parts placement is not critical in general but keeping the parts close together and connections as short as possible are important for the stability of this transmitter. I set the major parts on the board and moved them around until I came up with a placement that looked like it would have short connections and a good circuit flow.



Schematic of my Hartley, showing values of the parts I used.

The PA coil and standoffs were mounted first. The coil consists of 13 turns of 1/4" copper tubing 3" in diameter. I wound the copper tubing on a 2.5" piece of PVC tubing and then slid the tubing off the form. The coil is suspended between two ceramic standoffs. I love the look of a copper tubing coil because it is so typical of the real 1929 transmitters. I did have to experiment with the number of turns on the coil versus the tuning capacitance in order to get the transmitter into the 80 meter band.

A grid dip meter was used to help determine the right amount of inductance (turns of copper tubing) and the fixed/variable capacitor to put the transmitter on 3550 kHz. It turns out the grid dip oscillator readings were right on the mark because the transmitter did indeed tune to 3550 kHz with no problems. The variable tuning capacitor and tube socket were placed in front of the PA coil.

As mentioned virtually all the parts were fastened with wood screws. The two machine screws were used to mount the variable capacitor. The LC tank circuit connections should be made with a beefy wire or tubing connection in order to offer the lowest possible resistance to the high circulating currents that occur here. All PA tank circuit connections were made with 1/4" copper tubing that was squeezed flat with holes drilled at the ends for making connections. I chose the flattened copper tubing just because I wanted to try it, I liked its looks, and I knew it would have excellent current carrying capabilities.

The other connections can be made using #12 or #14 copper house wiring with the vinyl insulation removed. I like the current carrying ability of the wire and the fact that it can be bent to create right angle wire routing similar to the look of the real 1920s transmitters.

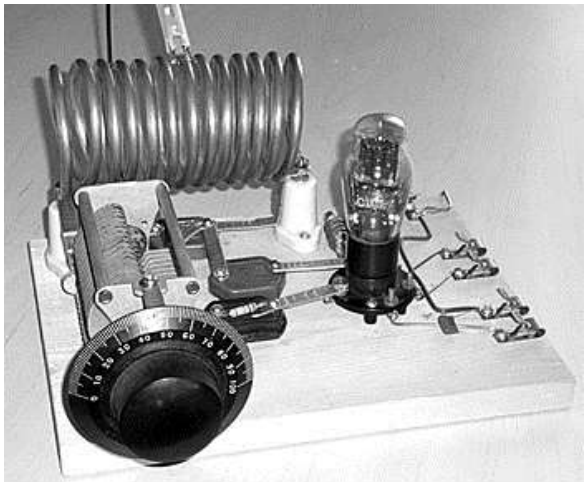
Key and power supply connections are brought onto the board using brass Fahnestock clips that I purchased at the AWA Convention. For safety reasons, I placed the high voltage Fahnestock clips at the rear of the board. The 2.5 volt filament clips were placed near the tube, on the left side, center. The clips for the key are on the left side of the chassis, closest to the operator.

Tuning

The only two "tune up" adjustments on the Hartley oscillator are the placement of the PA coil ground tap and the position of the antenna link on the PA coil. You will have to experiment with the ground tap location to discover the spot that provides just the right amount of grid drive and yields the best sounding tone. When I first powered up the transmitter it had a nasty buzzy tone, but I was able to move the clip lead to a tap position that yielded both safe plate current and good tone.

-continued on page 13-

Build a 1920s Ham Transmitter...



My transmitter worked great with the tap position shown in the picture, which is the sixth turn from the grid side (left side). The second adjust is the physical placement of the antenna link coil near the PA coil. For the antenna link, I simply coiled up two turns of #14 AWG house wire, leaving the insulation on, and inserted it in between the first and second turn of the PA coil at the grid end. I ran this connection right to the coax antenna cable. Between the tap setting and the antenna link coupling,

I was able to get two to four watts output depending on how hard I drove the tube. The goal is to adjust the antenna link coil to give you a decent power output and yet maintain a decent tone. Generally the harder the tube is driven, the worse the tone becomes, so it is a balancing act between power output, frequency stability, and tone. For the filament voltage I used a 2.5 vac transformer. For the high voltage power supply, I used a Heathkit TBD HV regulated power supply.

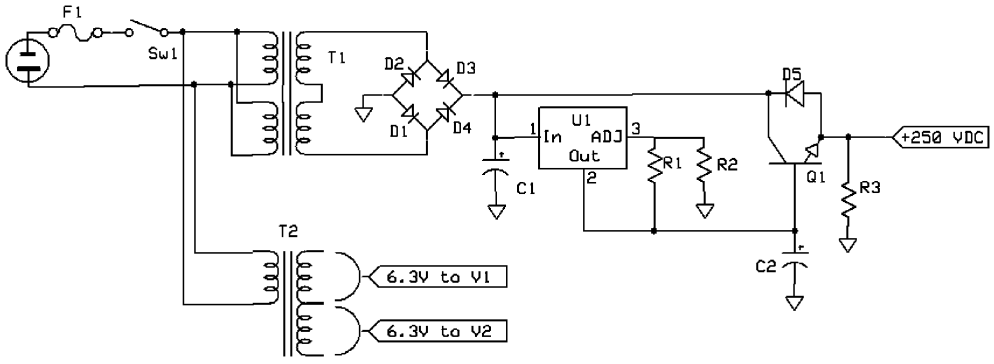
With the tap and antenna link position that I discussed, this transmitter was drawing approximately 35 millamperes at 200 volts. I measured 2 watts output into a Bird wattmeter and 50 ohm dummy load. The input power was 7 watts, output power 2 watts, yielding an efficiency of 28%. That's pretty darn good for an audio tube. Out of curiosity, I cranked up the high voltage to 250 volts and set the PA coil tap to yield 50 mA plate current. This resulted in 4 watts output with a good sounding tone.

Conclusion

In the 1920's the Hartley was the state of the art in tube oscillators and a favorite transmitter configuration of the 1920s hams. Some 90 years later in 2008 this transmitter circuit is still extremely popular and being used in 1929 style transmitters for making ham radio contacts coast to coast.

So even as the world rapidly changes around us, there are some things that remain the same and generate as much joy today as they it did the distant past. I enjoyed sharing this article with you and building my own Hartley transmitter at the same time. I hope you build your transmitter too because we'd love to hear you in the next AWA Bruce Kelly Memorial 1929 QSO Party!

Build the Power Supply Too!



Parts List (Mouser Part Numbers included):

C1: 100 µF, 450V electrolytic capacitor (66-EKXG451ELL101MM40S); **C2:** 1 µF, 450V electrolytic capacitor (598-SK010M450ST); **D1 - D5:** 1N 4005 diodes (512-1N4005); **F1:** 0.5A fuse, sized to fit whatever holder you use; **Q1:** TIP50 general-purpose power NPN transistor (511-TIP50); **R1:** 2.2k, 1/4-watt resistor; **R2:** 450k, 1/4-watt (use a 330k and a 120k in series); **R3:** 150k, 1/2-watt; **T1:** 230 VCT, 0.11A power transformer (533-VPS230-110); **T2:** 12.6 VCT, 1.0A power transformer (41FG010); **U1:** 450V adjustable 3-terminal regulator (689-LR8N3-G)

Thanks to Our 2024 Hamfest Sponsors! Please Support Them!

CALENDAR

June 12, 2024 - Monthly Club Membership Meeting, 7 pm at Rensellaer County Search & Rescue. Field Day planning

June 22-23 - Field Day at the Rensselaer County Search and Rescue Building.

REMINDER! EGARA will NOT meet during July and August. There will also be no newsletter published.

Enjoy your summer and see you in September!

Pro Tip: Take Time To Read The Manual!

When it comes to technology devices and products, many of us don't take the time to "read the manual"—or, in modern terms, fully explore the features.

Even if you think you really understand the capabilities of your device or app, check the manual anyway because you often can still discover helpful capabilities that can increase your productivity and help you use your tech to its fullest extent.

And in those cases where the manual is poorly written or organized, you can often find what you need by doing an Internet search or even a YouTube search. Many times someone else has who has struggled with a piece of technology has been kind enough to produce a video when they found a solution. Heavily menu-driven HT radios are one good example where YouTube videos may be available and very helpful.

The best thing you can do is spend some time learning features— because what's possible just might surprise you. -

The East Greenbush Amateur Radio Association

Organized in 1998, by Bert Bruins, N2FPJ, (SK) and Chris Linck, N2NEH, the East Greenbush Amateur Radio Association, an ARRL affiliate, is committed to providing emergency services, educational programs, and operating resources to amateur radio operators and residents of the Capital Region of New York State. The club station is W2EGB. The club also has several VHF and UHF repeaters open to club members and the public.

GEAR FOR SALE

- **Complete HF Station for Sale:** Elecraft K3 Transceiver, 100W, includes both SSB and CW roofing filters; Elecraft P3 Panadaptor, gives spectrum display; Elecraft KPA 500-watt power amplifier with internal power supply); Elecraft KAT500 automatic antenna tuner; Astron RS-35M linear power supply for transceiver. all needed interconnect cables to integrate units. All original user manuals and custom dust covers included. This equipment originally cost over $12,000, and is in like-new condition. Asking $4,000 for the entire set. Prefer to sell the entire set to a single buyer.

  Contact: Bill Leue, text to: 518-410-6942.

- **Whistler WS1040 Digital Scanner.** Comes with everything except the box. This digital handheld scanner stores up to 1,800 frequencies and lets you search for nearby frequency transmissions and automatically jumps to a found transmission. Also receives storm reports and more before they are broadcast on TV or radio. $200.00 FIRM.

  Contact info: davidjaegerjr@gmail.com

- **Heil RS 1 12' riser brand new $ 30.00**

  Contact Walt, N2WJR at N2WJR07@gmail.com

- **VIBROPLEX "Bug" semi-automatic key.** Original "PRESENTATION" Model with Gold Plated baseplate escutcheon. Heavily chromed upper parts, bright red finger pieces, jeweled bearings. Lists for $350, sell only $250, plus postage if shipped. Beautiful wood case.
  Contact Steve at: (518) 326-0902 or stevewb2hpr@gmail.com

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